View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Cardinal Scholar

Abstract

Thesis: Malononitriles and Cyanoacetamides Containing Isoxazoles and Isoxazolines

Student: Lee Courtland Moores

Degree: Master of Science

College: Science and Humanities

Date: July 2011

Pages:

Isoxazoles and isoxazolines have been shown in the literature to be an important scaffold for pharmaceuticals and insecticides, as well as a source of synthetic versatility important to many syntheses. As a substitute for other aromatic rings, isoxazoles are known to change the efficacy of a given compound. Isoxazolines can be used as a precursor to many other functional moieties that may be effected during earlier synthetic steps. There are many routes to the heterocyclic moiety, allowing for their insertion in a wide range of molecules. Our group has previously reported a condensation of arylaldehydes with hydroxylamine to first make an aryloxime which can, after generating the nitrile oxide, then cyclize with an alkene or alkyne *in situ* and create the isoxazoline or isoxazole, respectively.

The Knoevenagel Condensation reaction is identified as the addition of an activated methylene complex, malononitrile or cyanoacetamide, with a carbonyl followed by dehydration.. Our group has previously reported a facile, one-pot reductive alkylation of benzyl malononitriles. These compounds have been noted as having many insecticidal uses, as well as being potent pharmacophores.

The scope of this project is to further explore and optimize the condensation of aryl aldehydes and methylene complexes. The condensed and reduced methylene complex will then be alkylated to join the heterocyclic moiety to reach the final disubstituted methylene product. A second approach will also be explored in which the monosubstituted malononitrile will first be alkylated with allyl or propargyl bromide, which can then undergo a 1,3-dipolar cycloaddition with a nitrile oxide. The library of compounds generated will be sent to collaborators to test the biological activity of the molecules.